

Suppose we have a function (or graph) that tells us our position along a straight line at any time  $t$ .

$s(t) = f(t)$  sometimes  $x(t)$  or  $y(t)$  are used...

Then we can take the derivative(\*) to get a function that tells us our velocity at any time  $t$ .

[[velocity is speed ~~and~~ direction]]

Our speed is given by the absolute value of velocity.  
\* speed is always positive \*

$v(t) = f'(t) = s'(t)$

In the same way we can take the derivative again to get the acceleration [[rate of change of velocity]]

$a(t) = v'(t) = s''(t)$

We are talking here about motion in a "straight line".

Think of a choo choo train that can go only forward or backward (+velocity, -velocity)

5.4 examples

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